CAMBRIDGE ADVANCED NATIONALS

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Oxford Cambridge and RSA

Sample assessment material

LEVEL 3 ALTERNATIVE ACADEMIC QUALIFICATION CAMBRIDGE ADVANCED NATIONAL IN

HUMAN BIOLOGY

Extended Certificate H149

For first teaching in 2025

F171: Health and disease

Version 1.0 (June 2024)

Introduction

This is Sample Assessment Material (SAM) which has been produced for the qualification OCR Level 3 Alternative Academic Qualification Cambridge Advanced National in Human Biology (Extended Certificate).

The SAM is an example exam paper that we publish alongside a new specification to help illustrate its intended style and structure when a qualification is first launched. We wanted to share the story of our assessment approach with you so when you look through the paper you will find we have pointed out certain features and explained the decisions we have made.

Resources to help support in teaching different areas of content can be found on the OCR Level 3 Cambridge Advanced National in Human Biology webpage under Planning and teaching '.

Our exam papers are developed with accessibility in mind. The Understanding the assessment guide tells you a little more about the principles and rationale underpinning our approach for the qualifications. The 'Command Words' are in both the Understanding the Assessment guide and the specification. These tell you what we mean by each command word and how students should approach the question and understand its demand.

Appendix B of the specification: **Command Words**, gives detail about what is expected of each command word that will be included in exams and mark schemes. You can include teaching around the expectations of these as part of your teaching.

You said, we did

During the development of this qualification, we talked extensively with teachers, subject experts, higher education institutions and our senior assessment teams to influence its structure, content and assessment materials. We then shared our final materials with teachers to make sure that they met their needs.

You told us that you wanted individual exam questions to build up in parts, so we've included questions with sub-parts to incorporate this approach.

You also told us that questions that needed long responses in contexts that are unfamiliar to students are particularly challenging. We've focused on making our exams accessible by using contexts that will be familiar to students, keeping scenarios short and only including information that is needed to answer the questions.

You said that questions containing data or graphs for students to interpret were really appropriate in these assessments as it's so fundamental to the subject, so we've included a number of questions that require this.

You identified that the qualification and assessments need to appeal to a wide range of students and allow progression of subject knowledge and understanding from GCSE combined science qualifications. Higher Education Institutions also told us where there may be knowledge and skills gaps in undergraduate students progressing to their courses. We've developed our exams with effective progression from key stage 4 science qualifications, and to appropriate HEI courses, in mind.

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All students will sit the exam at the same time on the same day.

This exam will always be set and marked by us. Exams will be available in January and June each year. Students can resit this unit and the best result will be used to calculate the certification result.

If students require additional answer space, lined paper may be available at the end of the answer booklet in a live question paper. Remember the question number(s) must be clearly shown.

OCR
Oxford Cambridge and RSA

<<Date>> – <<Morning/Afternoon>>

Level 3 Alternative Academic Qualification Cambridge Advanced National in Human Biology

H149 Unit F171: Health and disease

Sample Assessment Material (SAM)

Time allowed: 1 hour 15 minutes
XXX/XXXX

No extra materials are needed

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

Date of birth | D | D | M | M | Y | Y | Y | Y |

INSTRUCTIONS
- Use black ink.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- In the live exam there might be lined pages at the end of the question paper for you to use if you need extra space. Remember, you must clearly show the question numbers.
- Answer **all** the questions.

INFORMATION
- The total mark for this paper is **60**.
- The marks for each question are shown in brackets **[ ]**.
- This document consists of **16** pages.

ADVICE
- Read each question carefully before you start your answer.

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This unit is part of the Extended Certificate qualification. It is **not** included in the Certificate qualification.

The time allowed is designed to give students approximately one minute per mark plus reading time.

There are no sections in this exam and there are no optional questions.

The exam will always have 60 marks. There are no sections in this exam.

In this exam there will be between 5-15 PO1 (show knowledge and understanding) marks. PO1 marks allow for knowledge and understanding to be assessed out of context in this assessment. PO1 is assessed in question 1, for example in 1(b), by requiring students to define a disease.

Question 2(a) and (b) are an example of explain PO1 questions. Two marks are available for explanations of how smoking causes damage that leads to Chronic Obstructive Pulmonary Disease (COPD). Credit will be given for any appropriate response.

2

Answer **all** the questions.

1

(a) What is a medical sign?

.....

..... **[1]**

(b) What is a disease?

.....

..... **[1]**

2

(a) Explain how smoking causes damage that leads to Chronic Obstructive Pulmonary Disease (COPD).

.....

.....

.....

..... **[2]**

(b) Explain how diet **and** exercise can improve the symptoms of COPD.

Diet .....

.....

Exercise .....

.....

[2]

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All questions in this exam are mandatory. A range of question types are used, including:

- Forced choice/controlled response questions (also known as multiple choice questions (MCQs)). These are typically 1 mark but may have a maximum of 4 marks for a single MCQ.
- Short answer closed response questions. These questions sometimes might involve diagrams or calculations. They are typically worth 1 to 4 marks.
- Low tariff, extended constructed response questions, with a points-based mark scheme. These have 1 mark per factor or feature to a stated maximum, typically 1 to 4 marks.
- Higher tariff, extended constructed response with levels of response mark scheme. There will always be one 6-mark question and one 9-mark question.

These question types allow us to assess the following Performance Objectives:

- PO1 – Show knowledge and understanding
- PO2 – Apply knowledge and understanding
- PO3 – Analyse and evaluate knowledge, understanding and performance.

The questions will sample content from across all Topic Areas. At least one question (or sub-part) will relate to each Topic Area. Sub-content topic areas will be sampled across exam papers, over time.

Diagrams will always be in grayscale.

In unit F171 Health and disease, there will be between 30-40 PO2 (apply knowledge and understanding) marks. This proportion of PO2 marks helps to ensure there is a clear applied focus to the assessment of the content in this unit. PO2 is assessed in question 3(a), for example, by requiring students to explain which antibiotic should be used to treat an infection from stimulus provided.

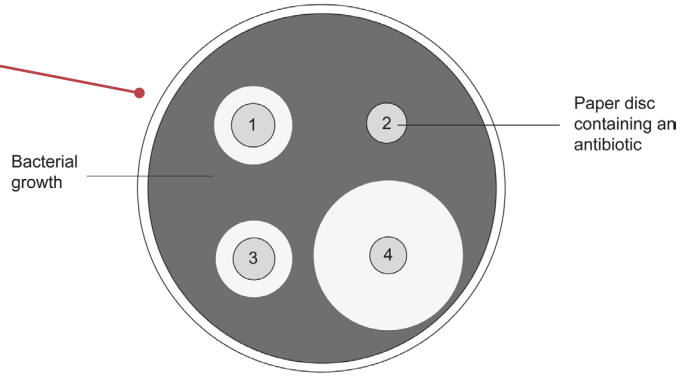
3 Amir is investigating the activity of different antibiotics in the control of bacterial-based diseases.

Amir inoculates an agar plate with bacteria taken from an infected wound of a patient.

He places discs 1 to 4 containing different antibiotics on the surface of the agar.

Amir incubates the agar plate at 25 °C.

After one week, the plate looks like this:



(a) Explain which antibiotic on Amir's agar plate should be used to treat the infection.

Antibiotic .....

Explanation .....

.....

[2]

(b) Explain what action Amir could take to ensure that he has chosen the most suitable antibiotic.

Action .....

.....

Explanation .....

.....

[2]

(c) Amir's investigation lacks a control.

Explain how **one** control would make this agar plate test more valid.

.....

.....

.....

..... **[2]**

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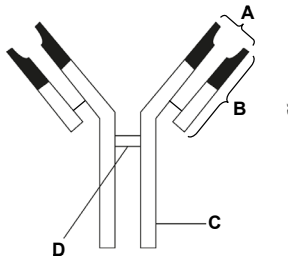
This question assesses PO2 by asking students to identify regions of an antibody on a diagram.

4 Antibodies contain different regions.

Identify regions **A**, **B**, **C** and **D** in the diagram of an antibody.



A .....

B .....

C .....

D .....

[4]

The number of marks for a question will always be given at the end of the question and will always be right aligned.

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When a question asks for a specific number of points, we will always put numbers or response headings against the answer lines to show where students should write each point of their answer.

This question assesses PO2 by asking students to select one of two possible options for monitoring blood pressure and then to outline the reasons for their choice. In this example, both options are appropriate and therefore both marks are awarded for a valid reason identified.

5

(a) Ben has made an appointment at a clinic.

Ben is a 63-year-old, with no pre-existing chronic conditions.

One test at the clinic involves measuring his blood pressure.

Ben's first reading is high at 150 / 93 mm Hg.

The health practitioner re-takes Ben's blood pressure two more times.

Ben is allowed to rest for 5 minutes between each test.

Identify **two** examples of good practice by the health practitioner.

1 .....

.....

2 .....

.....

[2]

(b) Ben's blood pressure is still high.

The health practitioner arranges for Ben to monitor his own blood pressure at home.

Ben measures his blood pressure for a week.

He has a choice of **two** options to monitor his blood pressure.

Option 1: Wear a device on his arm for 24-hour monitoring.

Option 2: Take his blood pressure twice a day with a portable device.

Select **the** option you would choose.

Outline **two** reasons for your choice.

Option .....

Reason 1 .....

.....

Reason 2 .....

.....

[2]

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MCQs might target either PO1 or PO2 marks.

6 The process of analytics involves analysing raw data and looking for meaningful patterns.

The table shows the **six** stages involved in this process.

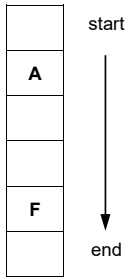
The stages are **not** in the correct order.

When we ask an **order the steps** question, we may use letters to label the steps. Students choose their answer(s) and write the letter in the space given. In this question, there is one mark for one correct answer, two marks for two or three correct answers and three marks for four correct answers.

Stage	Process
A	Interpretation
B	Analysis
C	Reporting
D	Data collection
E	Extraction
F	Transformation

Write a letter for each stage in each box to show the **correct** order.

Two stages (**A** and **F**) have been done for you.



[3]

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Question 7 assesses PO2 through 'maths in science' skills.
In this question full marks are given for the correct final answer. Otherwise one mark is available for either:
- 1042 ÷ 11
- 94.73 (correct working but answer not given to 2sf)

7 A group of patients are anaemic.

They have regular blood tests to monitor the number of platelets in their blood.

The results of the blood tests are in the table below.

Patient	Platelet count
1	105
2	92
3	81
4	86
5	110
6	98
7	101
8	92
9	92
10	83
11	102

Calculate the mean of the platelet count in the table.

Give your answer to 2 significant figures.

If students are required to give their answer to a certain number of significant figures or decimal places, then this will be clear from an instruction in the question.

mean = ... **[2]**

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This question assesses PO2 by asking students to identify two stages showing bad practice from the stimulus, and then to explain why these actions are considered bad practice.

When a question asks for a specific number of points, the number of points needed will be in bold.

8 Eve is invited to a clinic to be observed using her peak flow meter.

The health practitioner is concerned that Eve is not using her peak flow meter correctly when monitoring her asthma and recording her results at home.

The health practitioner observes the following stages in the procedure:

1 Eve moves the marker to the starting position.
2 She sits on a chair and leans forward to do the test.
3 She takes the deepest breath possible.
4 She positions her mouth around the mouthpiece without creating a tight seal with her lips.
5 She blows hard and fast into the peak flow meter.
6 She takes the reading and repeats the procedure twice more.
7 The highest reading of the three attempts is recorded.

Identify **two** stages showing bad practice by Eve and explain why.

Stage .....

Explanation .....

.....

Stage .....

Explanation .....

.....

[4]

9 Sara and Ali are going on a walking holiday in May through an area of countryside.

- Ticks are becoming more common in the area they are visiting.
- Ticks live on the surface of plants.
- Ticks cannot fly or jump but can easily climb onto passing objects.
- Ticks may carry the bacteria causing Lyme disease.

Identify **four** preventative measures for Sara and Ali to take to reduce their risk of Lyme disease.

1 .....

2 .....

3 .....

4 .....

[4]

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10 Zac is an active 12-year-old.

He has fallen off his skateboard.

Zac has broken a bone in his left forearm.

The doctor has decided to give Zac a fibreglass cast to support his arm.

Outline **two** reasons why the doctor would choose to give Zac a fibreglass cast rather than a plaster cast.

1 .....

.....

2 .....

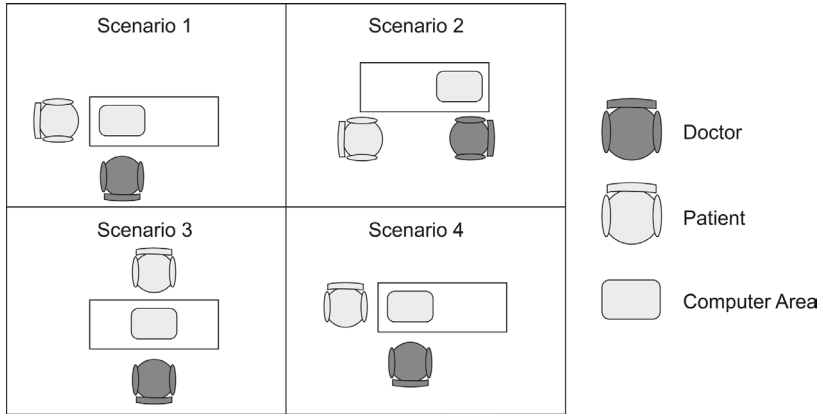
.....

[2]

Where context is given, it will be kept as short as possible and will only include information needed for the questions.

Q11 assesses PO2 by asking students to interact with the context to identify three reasons why scenario 2 is most likely to give the best consultation experience.

11 The layout of a doctor's consulting room can affect the consultation experience.



Appendix B in the specification contains a glossary of Command Words which could be used in this exam. The glossary tells you what we mean by each command word.

Identify **three** reasons why Scenario 2 is **most likely** to give the best consultation experience.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

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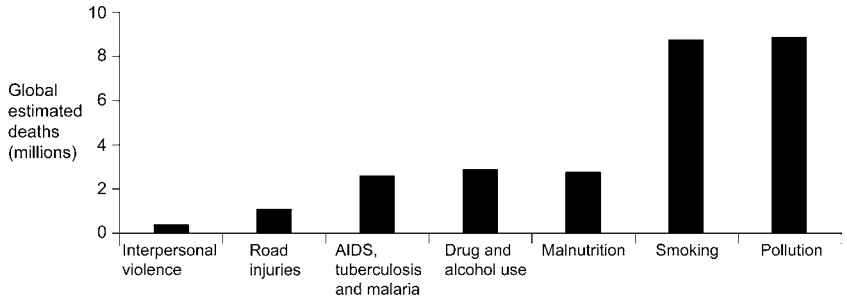
Q12 assesses PO2 as students must interpret information given in the bar chart to identify three observations.

12 Global estimated deaths can be classified by major risk factor or cause.

The bar chart shows some data obtained for this type of research.



Identify **three** observations from the bar chart.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

13 Nina is a 60-year-old woman.

She takes hormone replacement therapy (HRT) medication.

Nina has missed her mammogram appointment for breast screening.

She self-examines her breasts and finds a lump in her left breast.

Nina visits her doctor for a consultation.

Explain **two** different actions the doctor may take as a result of the consultation.

Answers must relate to the scenario/ situation where appropriate.

Explain is a command word which can assess either PO1 or PO2, depending on whether a question is set in context or not. Where a question asks students to **explain**, they must show (PO1) or apply (PO2) their knowledge and understanding. It is not enough to recall or apply knowledge alone.

1 .....

.....

2 .....

.....

[4]

This is an example of a 4 mark **explain** question. Two marks are available for each action explained.

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PO3 (analyse and evaluate knowledge, understanding and performance) will always be assessed by two levels of response questions:

- one 6-mark **analyse** question and
- one 9-mark **discuss** question.

The questions' topics may be drawn from any relevant aspect of the unit's teaching content.

Extended response questions give students a real opportunity to show the extent of their knowledge and understanding of the subject by using analytical and evaluative skills.

14 Orla is a 65-year-old with **early stage** Parkinson's Disease. Parkinson's Disease cannot be cured and is progressive.

Orla is independent in her daily living activities. Orla has concerns about her balance and ability to participate in some activities. Orla lives alone.

Orla has a history of:

- depression
- mild bradykinesia (slowness of movement and speed)
- resting tremor
- decreased range of movement in her joints because of muscle stiffness and pain
- mild cognitive impairment.

Parkinson's Disease treatments include:

- supportive therapies
- medication
- surgery.

Analyse the therapeutic effects of the treatments on Orla's early stage Parkinson's Disease.

.....

.....

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.....

.....

..... **[6]**

Q14 is an example of a 6-mark **analyse** question.

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Q15 is an example of a 9-mark **discuss** question. It will assess a student's ability to present, analyse and evaluate relevant points (for example, for/against an argument) to make a reasoned judgement.

15 The team at a general practice surgery are trying to decide if they should change from **manual** to **electronic** health records.

The surgery has a number of issues which the team are trying to balance. The issues include:

- an increasing number of patients
- patient consultations limited to 10 minutes
- lack of space within the surgery
- a renewed focus on patient privacy
- an increased awareness of sustainability practices
- a need to communicate with a range of other medical professionals
- ongoing staff training
- a challenging financial budget.

Discuss whether the surgery should change to an **electronic** health records system.

In your answer you **must** write about:

- any **benefits** of the electronic health records system for the general practice surgery
- any **limitations** of the electronic health records system for the general practice surgery
- whether you would recommend that the general practice surgery use electronic health records **and** your reasons.

.....

.....

.....

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